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WALTER H. FLOOD & CO., INC.

Soil Investigation No. 7205-0005-1  
Proposed Solid Waste Disposal Site  
Near Torrence Avenue and Tri-State Expressway  
Lansing, Illinois

Prepared for

RECEIVED  
JUL 21 1972

ENVIRONMENTAL PROTECTION AGENCY  
STATE OF ILLINOIS

Waste Management, Inc.  
309 Lorle Boulevard  
Oak Brook, Illinois 60521

June 30, 1972

ESTABLISHED 1913

WALTER H. FLOOD (1888-1981)

812-499-1872

JAMES G. FLOOD, P.E.  
RAYMOND J. FLOOD, P.E.  
PAUL E. FLOOD, P.E.



KALAMAZOO OFFICE:  
1619 S. WESTNEDGE AVE.  
PORTAGE, MICHIGAN 49063  
812-321-2093

WALTER H. FLOOD & CO., INC.

MEMBER

AMERICAN SOCIETY FOR TESTING & MATERIALS  
AMERICAN PUBLIC WORKS ASSOCIATION  
AMERICAN CONCRETE INSTITUTE  
AMERICAN CHEMICAL SOCIETY  
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS  
CONSULTING ENGINEERS COUNCIL  
ILLINOIS SOCIETY OF PROFESSIONAL ENGINEERS  
AMERICAN ASSOCIATION FOR THE  
ADVANCEMENT OF SCIENCE  
AMERICAN SOCIETY OF CIVIL ENGINEERS  
THE BUG & TIGER CONGRESS

ENGINEERS  
6102 SO. BLACKSTONE AVE.  
CHICAGO 60637

June 30, 1972

INSPECTION AND TESTING OF  
MATERIALS AND STRUCTURES  
SPECIFICATIONS AND REPORTS  
PHYSICAL AND CHEMICAL TESTS  
RESEARCH AND CONSULTATION  
CONCRETE CORE CUTTING  
FOUNDATION INVESTIGATION  
FACILITIES INSPECTED  
BY CEMENT & CONCRETE  
REFERENCE LABORATORY

Waste Management, Inc.  
900 Joliet Boulevard  
OakBrook, Illinois 60521

Attention: Mr. Lawrence Beck

Re: Soil Investigation No. 7205-0005-1  
Proposed Solid Waste Disposal Site  
Bear Torrence Avenue and Tri-State  
Expressway  
Lansing, Illinois

Gentlemen:

Inclosed is our report of the subsoil investigation for the reference project.  
If you have any questions concerning this report or should we be able to assist  
you in any way, please call upon us.

The soil samples are being retained in our laboratory until released by you.

Respectfully submitted,  
WALTER H. FLOOD & COMPANY, INC.

Robert J. Rospunda  
Project Geologist

Raymond J. Flood  
Registered Professional Engineer  
Illinoian 2177

Enclosure

For your convenience, the following file  
is available for inspection at our office.

# WALTER H. FLOOD & CO., INC.

Soil Investigation No. 7205-0005-1

**ALL WE NEED!**

## I. Scope

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and represents the results of the additional subsoil investigation for the proposed solid waste disposal site to be located in the area of Torrence Avenue and the Tri-State Expressway in Lansing, Illinois.

The purpose of the investigation is to secure and log subsoil information, to record the geological nature, type, consistency and thicknesses of the various soils strata as encountered in the borings, to perform laboratory tests, and to aid others in the appraisal of the site and to assist others in the design and construction of the specific project at the location discussed in this report.

## II. Site Geology, Soil Conditions and Characteristics

The proposed site is located in a general area of post-glacial lake bottom. The area was inundated in the geological past by the waters of Lake Chicago, the geological predecessor to present Lake Michigan.

Please refer to the enclosed boring location diagram and the soil profiles which were prepared from the six test borings made at the site.

The soils at the site consist of lacustrine clays with silt layers which overlie glacial clay till. Several till sheets are recognized at the site. Between the till sheets at some of the boring locations some outwash sands and silts are noted. Occasionally, lenses or layers of sand and silt are present within till sheets.

Surface till is present at the boring locations but is relatively thin. A coarse, light-colored, loamy material of the till is present at the boring locations and is generally thinner. In some places the till consists almost entirely of clay, while in other portions of the site the clay is mixed in with wood, gravel, and concrete rubble till material.

At depths of about 10 feet no plants are present at the site down to about elevation 1100 ft. The soil consists mostly of clays but with occasional silt lenses and fine gravel.

At the base of the site there is a layer extending at least to the total depths of the borings consisting of clay and silt sheets. Very separate till sheets appear to be

II. Site Geology, Soil Conditions and Characteristics (continued)

present. From youngest to oldest these are tentatively identified as Park Ridge, Linley, Valparaiso, and Pre-Valparaiso tills.

"Petaloid" was encountered at borings #2, #5, and #6 at depths of 84.4', 61.1', and 77.6', respectively (elevations 315.6' to 335.9'), and may represent the bedrock surface. Bedrock in the area consists of dolomite of the Silurian System.

III. Conclusionsa. Site Suitability

The lacustrine sediments and the glacial tills at the site are highly impermeable as a mass. Except for local layers of relatively more permeable sands and silts at the site, the sediments and tills will provide a natural seal to prevent leachate from the proposed fill from entering the ground-water aquifers.

Where local layers of more permeable sand and silt occur in the walls and floor of the proposed pit, they can be readily sealed by use of compacted clay. Clay soils at the site will be suitable for use as compacted clay liner where needed. Where clay liner is required, it is to be placed and compacted in layers.

It is noted that no continuous pervious stratum was encountered at the site, either in the lacustrine deposits or the glacial tills. All layers or lenses of relatively more permeable sand or silt appear to be local.

b. Ground Water

Groundwater readings were made in the boreholes during drilling, immediately after completion of drilling, and at intervals after completion of the boreholes.

Groundwater level readings were made in the boreholes and in the observation wells recorded at the times indicated on the soil boring logs and on the enclosed construction drawings. However, it must be noted that fluctuations in the level of the groundwater occur due to variations in rainfall, temperature, soil permeability, and other factors. At the time of the water level measurements, The contractor has determined that infiltration is sufficiently limited, the design drawings indicate that infiltration is controlled, infiltration is sufficiently limited, the design drawings indicate that infiltration is controlled, infiltration is sufficiently limited, and construction planning indicates that infiltration is controlled, infiltration is sufficiently limited, and infiltration of the ground water.

III. Conclusions (continued)C. Observation and Test Wells

Observation wells have been placed at two of the boring locations. As requested, one of the wells has been placed at the north side of the proposed waste disposal site and one at the south end. These have been placed at boring locations #6 and #1 respectively.

The depths at which these wells have been placed is indicated on the enclosed soil profiles and as indicated on the table below.

Well No.	Surface Elevation*	Size	Material	Tip elevation	Screen Size	Screen Length	Ground-water Elevation** (6-30-72)
LA	600.0'	2" I.D.	PVC	529.0'	.010	4.0'	563.2' 596.5
6A	599.0'	2" I.D.	PVC	544.0'	.010	4.0'	598.3' 572.0

\*See report for method determined.

\*\*Reading made on date indicated (continuing readings to be made).

The procedures and materials used in the installation of the wells are as follows:

Pipe type: PVC  
Pipe size: 2" I.D.  
Screen size: .010  
Screen length: 4.0'

The bored hole was used if hole not caving. If hole was caving, 3" I.D. casing was set. Prior to installing the well point and sand pack, the hole was flushed with clean water. The well point and casing were set at the selected depth and sand pack consisting of #2 Torpedo sand was placed around well point. A backfill seal consisting of 50% bentonite and 50% sand was then placed to the ground surface. All installation data was recorded in the field, including the depth of the point tip, the length of pipe installed, the depth to the top of the sand pack, the screen size and length, and ground-water levels. Continuing water level readings are being made in these wells.

e. Drainage Permeability

A laboratory permeability test was run on the dense Valparaiso till and field permeability tests were run on the lacustrine silt and lacustrine clay. The coefficient of infiltration was computed from data from these tests.

ON SITE  
SAMPLE?

**WALTER H. FLOOD & CO., INC.**

Soil Investigation No. 7205-0005-1

Page 4

**III. Conclusions (continued)****D. Soil Permeability (continued)**

<u>Soil Type</u>	<u>Coefficient of Permeability</u>
Lacustrine clay	$6.6 \times 10^{-7}$ cm/sec.
Lacustrine silt	$2.4 \times 10^{-6}$ cm/sec.
Glacial till	$1.9 \times 10^{-7}$ cm/sec.

**IV. Conditions of Investigation****A. Changed Soil Conditions**

The analysis and recommendations made in this report are based upon the data obtained from the six borings performed at the locations selected by your consultant. This report does not reflect any soil variations which may occur between the borings. Since the nature and extent of soil variations between the borings may not become evident until construction, it may be necessary to re-evaluate the recommendations of this report after performing on-site observations during the excavation period of construction. It is recommended that we be retained to perform continuous construction review as the project proceeds. We can assume no responsibility for the construction compliance with the recommendations unless we have been retained to perform this on-site review.

**B. Soil Boring Logs**

The soil boring logs have been prepared from the field and laboratory data. The soils descriptions have been made by visual classification by qualified soils personnel. Consistency classifications are based upon the laboratory test or field penetration test data. The stratification lines may represent approximate boundaries between soil types as the change may be transitional. For instance, coloring changes in the upper soils are often due to weathering and are usually transitional rather than abrupt. Natural topsoil stratification is almost always transitional. Soil stratification by consistency may be abrupt in the case of stratification of soils of differing origin, but may be transitional in soils of the same origin.

**C. Laboratory Tests**

Laboratory tests performed on samples of the soils consisted of calibrated penetrometer, water content (AASHO D248-60), grain-size distribution, permeability, and density. The results of these tests are noted on the enclosed boring logs, soil stratigraphy, AASHTO textural classification chart, and particle-size distribution curves.

## IV. Conditions of Investigation (continued)

## C. Laboratory Soil Tests (continued)

Although no ion-exchange capability tests were conducted on soil samples, data from the University of Illinois Agricultural Experiment Station Bulletin 665 indicates that the ion-exchange capacity of the soils would be of the magnitude of 20 milliequivalents per 100 grams.

V. HIGH!

## D. Field Investigation

The field investigation for the four most recent borings (#1, #2, #5, and #6) was started on May 23, 1972 and completed on May 25, 1972. Two previous borings #3 and #4 were made in January 1972. The test borings were made with truck-mounted hollow stem auger type drill rigs utilizing split tube (ASCE D1586-67) type of sampling at 2.5-foot maximum intervals. Six test borings were made. The soil types, nature, consistency, strata depths and thicknesses, and the sampling data were recorded on the field logs. In the split tube sampling, the standard penetration "N" (the number of blows of a 140-pound hammer dropping 30 inches to drive the standard 2-inch dia. split tube) was recorded in 6-inch increments and entered on the field logs. Representative samples from the split tube were placed in jars, sealed, and delivered to the laboratory for further classification and testing.

In the non-cohesive soils the hollow stem auger served as casing to prevent caving of the soils.

During drilling, immediately after completion of drilling, and intermittently after completion of drilling, readings of the ground water were taken in the boreholes and the readings recorded on the boring logs.

Ground surface elevations of the properties were determined from site topography and from the City of Skokie ("Sketch Map 30, 136 N. 81st Street, Cook County, Illinois") and are estimated to be within an accuracy of 1/10' of the stated elevation.

FOR: Waste Management, Inc.  
 PROJECT: Proposed Solid Waste Disposal Site  
 LOCATION: Lansing, Illinois  
 METHOD OF BORING: HS  
 SPLIT SPOON SIZE: 2 IN.  
 WT. OF HAMMER 140 LBS.  
 INCH DROP 30  
 SHELBY TUBE SIZE  
 CASING USED 2½" I" IS

SOIL BORING LOG NO. 1  
 Sheet 1 of 2  
 WALTER H. FLOOD & CO., INC.  
 • Engineers •  
 • CHICAGO • KALAMAZOO •

DATE OF BORING: 5-25-72  
 BY: BJ&JA&MC:bc  
 JOB NO.: 7205-0005-1  
 VERTICAL SCALE: 1"=10'

ELEV.	DEPTH	S	T	N	LR	DD	DESCRIPTION	Qu • LABORATORY OPENFETROMETER					
								X 1000	1	4	6	8	10
600.0	+0.0						Ground surface						
599.0	+1.0	1	ss	11	2		Black clay fill	17.1	▲	4000			
		2	ss	11	2		Brown clay, tough to very	19.3	▲	4000			
		3	ss	14	3		tough	18.5	▲	5000			
591.5	+2.5	4	ss	19	2		Brown clay, occasional silt	19.3	▲	4000			
		5	ss	7	2		seams, tough	1500	○	19.9			
589.0	+11.0	6	ss	8	2		Gray clay, occasional silt	2000	○	22.0			
		7	ss	8	2		seams, stiff to tough	2000	○	20.2			
		8	ss	9	2			1500	○	18.5			
		9	ss	10	2			20000	○	19.6			
		10	ss	10	2			2500	○	24.4			
574.0	+26.0	11	ss	10	2		Gray clay, trace of small	35000	○	19.6			
		12	ss	12	2		gravel, tough to very tough	4000	○	20.8			
		13	ss	14	2			716					
		14	ss	18	2								
		15	ss	16	2								
		16	ss	19	2								
559.0	-41.0	17	ss	26	2		Gray silt with fine sand layers, medium dense	19.0	▲				
556.5	-43.5	18	ss	18	2		Gray silty clay with silt & sand layers, trace of small	12.1	▲	5000			
554.0	-46.0	19	ss	21	2		Gray silty clay, trace of small gravel, very tough to	▲ 13.1	▲	6500			
		20	ss	16	2		hard	▲ 13.6	○	6000			
		21	ss	23	2			▲ 13.6	○	5500			
		22	ss	23	2			▲ 12.6	○	5000			
		23	ss	30	2			▲ 12.3			9000	○	
		24	ss	33	2			▲ 12.1			9000	○	
539.0	-61.0						Continued on Sheet 2						
							*...gravel, very tough						

ELEV.	DEPTH	S	T	N	LR	DD	DESCRIPTION	12	20	30	40	50
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LEGEND DEPTH FEET BELOW GROUND SURFACE							LEGEND DESCRIPTION						LEGEND NATURAL		
1	WASHOUT	WCR - BEFORE CASING REMOVAL													
2	WASHOUT	ACH - AFTER CASING REMOVAL													
3	WASHOUT	WD - WHILE DRILLING													
4	WASHOUT	WC - WET CAVE IN													
5	WASHOUT	OC - DRY CAVE IN													
6	WASHOUT	QC - UNCONFINED COMPRESSIVE STRENGTH													
7	WASHOUT	POUNDS PER SQUARE FOOT													
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FOR Waste Management, Inc.  
 PROJECT Proposed Solid Waste Disposal Site  
 LOCATION Lansing, Illinois

METHOD OF BORING: HS  
 SPLIT SPOON SIZE: 2 IN.  
 WT. OF HAMMER 140 LBS.  
 INCH DROP 30  
 SHELBY TUBE SIZE  
 CASING USED 2 $\frac{1}{4}$ " IDHS

WATER LEVEL READINGS  
 6.5', W.D. 43.5'  
 75.5' B.C.R.  
 7.5' A.C.R.  
 3.5' @ 24 HRS. AFTER DRILLING  
 MRS. AFTER DRILLING

SOIL BORING LOG NO. 2  
 Sheet 1 of 2  
 WALTER H. FLOOD & CO., INC.

• Engineers •

• CHICAGO • KALAMAZOO •

DATE OF BORING: 5-24-72 BY: BJ&JA&HC:bc  
 JOB NO.: 7205-0005-1 VERTICAL SCALE: 1"=10'

ELEV	DEPTH	S	T	N	LR	DD	DESCRIPTION	Qu	LABORATORY x 1000	O PENETROMETER		
								2	4	6	8	10
600.0	0.0						Ground surface					
599.0	- 1.0						Dark brown clay	17.6	▲ 4000			
596.5	+ 3.5	1	ss	10			Brown to gray clay, tough	16.6	○ 4000			
594.0	+ 6.0	2	ss	12			Brown clay, occasional silt seams, tough		▲ 23.5			
		3	ss	11			Brown to gray silt, medium dense		▲ 22.9			
		4	ss	16								
		5	ss	19				17.6				
586.5	+ 13.5	6	ss	7			Gray clay, stiff	○ 1500	● 21.4			
		7	ss	7				○ 1500	▲ 28.5			
581.5	+ 18.5	8	ss	6			See note	○ 1500	● 20.8			
579.0	+ 21.0	9	ss	8				2000	▲ 18.2			
		10	ss	9			Gray clay, trace of small gravel, stiff to very tough	2500	○ ▲ 18.2			
		11	ss	10				2000	● 20.8			
		12	ss	10				3500	○ 19.0			
		13	ss	9				2500	○ ▲ 15.5			
		14	ss	10				2000	● 22.6			
		15	ss	13				2500	○ ▲ 19.0			
		16	ss	21				2500	▲ 15.3	○ 6500		
559.0	+ 41.0	17	ss	21			Gray silty clay, trace of small gravel, very tough to hard		▲ 13.1	○ 6500		
		18	ss	19					▲ 12.9	○ 8000		
		19	ss	20					▲ 13.6	○ 8000		
		20	ss	24					▲ 12.3	○ 8000		
		21	ss	18					▲ 13.6	○ 8000		
		22	ss	25					▲ 12.1	○ 8000		
		23	ss	22					▲ 13.6	○ 8000		
		24	ss	24					▲ 13.1	○ 8000		
540.0	- 60.0						Continued on Sheet 2					
							Note: Gray clay with silt layers, little sand, trace of small gravel, stiff					
								10	20	30	40	50
								Wc	▲ NATURAL			

W.C.O	WASHOUT	H.U.H.	BEFORE CASING REMOVAL
AMP. H. HUMMEL	AUGER	ACR.	AFTER CASING REMOVAL
AMP. H. HUMMEL	WILLOW STEM AUGER	WD.	WHILE DRILLING
AMP. H. HUMMEL	SPLIT SPOON	WCI.	WET CAVE IN
AMP. H. HUMMEL	SHELBY TUBE	DCI.	DRY CAVE IN
AMP. H. HUMMEL	FISH TAIL	QU.	UNCONFINED COMPRESSIVE STRENGTH
AMP. H. HUMMEL	CONE		POUNDS PER SQUARE FOOT
AMP. H. HUMMEL	WC%		

FOR: Waste Management, Inc.  
 PROJECT: Proposed Solid Waste Disposal Site  
 LOCATION: Lansing, Illinois

SOIL BORING LOG NO. 2  
 Sheet 2 of 2  
 WALTER H. FLOOD & CO., INC.

• Engineers •

• CHICAGO • KALAMAZOO •

METHOD OF BORING:	WATER LEVEL READINGS		
SPLIT SPOON SIZE:	IN.	W.D.	
WT. OF HAMMER	LBS.	B.C.R.	
INCH DROP		A.C.R.	
SHELBY TUBE SIZE	HRS. AFTER DRILLING		
CASING USED	HRS. AFTER DRILLING		

See Sheet 1

DATE OF BORING:	See Sheet 1	BY:
JOB NO.:	VERTICAL SCALE:	

ELEV.	DEPTH	S	T	N	LR	DD	DESCRIPTION	LABORATORY X 1000		PENETROMETER	
								10	20	30	40
540.0	60.0						Continued from Sheet 1				
		25	BB	42			Gray silty clay, trace of small gravel, very tough to hard	▲ 12.1			9000+ 0
536.5	63.5	26	BB	97/8			Fine gray sand & silt layers, very dense	▲ 8.7			
534.0	66.0	27	BB	44			Gray clayey silt, trace of small gravel, very dense	▲ 7.8			
		28	BB	46				▲ 9.2			
		29	BB	37/8				▲ 8.9			
525.6	74.4	30	BB	77/8			Greenish-gray clayey silt, trace of small gravel, very dense	▲ 11.4			
		31	BB	55/8				▲ 10.8			
		32	BB	77/8				8.7 ▲			
		33	BB	77/8				▲			
515.6	84.4	34	BB	77/8			Refusal at 84.4'	7.6			

ELEV.	DEPTH	S	T	N	LR	DD	DESCRIPTION	10	20	30	40	50
							WR ▲ NATURAL					

LEGEND: DEPTH FEET BELOW GROUND SURFACE  
 SAMPLE IN HAMMER  
 HOLLOW STEM AUGER  
 PENETRATION HOLE IN PER FOOT  
 SAMPLE LENGTH  
 LENGTH OF SAMPLE IN FEET  
 DRY DENSITY IN POUNDS PER CUBIC FOOT

WD - WASHOUT  
 A - AUGER  
 HS - HOLLOW STEM AUGER  
 SS - SPLIT SPOON  
 ST - SHELBY TUBE  
 FT - FISH TAIL  
 CURE  
 WC - WATER CONTENT PERCENT

BCR - BEFORE CASING REMOVAL  
 ACR - AFTER CASING REMOVAL  
 WD - WHILE DRILLING  
 WCI - WET CAVE IN  
 DCI - DRY CAVE IN  
 UC - UNCONFINED COMPRESSIVE STRENGTH  
 POUNDS PER SQUARE FOOT

FOR Waste Management, Inc.  
 PROJECT: Proposed Solid Waste Disposal Site  
 LOCATION Lansing, Illinois  
 METHOD OF BORING: HS      WATER LEVEL READINGS  
 SPLIT SPOON SIZE: 2 IN. 13.5' W.D. & 23.5'  
 WT. OF HAMMER 140 LBS. 51.0' B.C.R.  
 INCH DROP 30 A.C.R.  
 SHELBY TUBE SIZE 48.0'00" AFTER DRILLING  
 CASING USED 3.9'01" DATE AFTER DRILLING  
 (2-11-86)

**SOIL BORING LOG NO. 3**

**WALTER H. FLOOD & CO., INC.**

• Engineers •

• CHICAGO • KALAMAZOO •

BY: .BJAIA:1wt

**VERTICAL**

**SCALE: 1"=10'**

ELEV	DEPTH	S	T	N	LR	DD	DESCRIPTION	QD	LABORATORY X 1000	O	PENETROMETER
								3	4	5	6
599.0	0.0						Ground surface				
598.0	1.0						See Note				
		1 ss	14	%			Brown to gray clay, very tough	19.9	5000	O	
		2 ss	18	%			to tough		6000		
		3 ss	15	%					5000		
		4 ss	12	%				3500	O	▲ 21.7	
588.0	11.0						Gray clay, occasional silt				
585.5	13.4	5 ss	11	%			seams, very tough	18.8	4500	O	
583.0	16.0	6 ss	31	%			Gray silt, very dense	3000	O		
580.5	18.5	7 ss	14	%			Gray clay, tough	2500	O	▲ 21.4	
		8 ss	9	%			Grav clay, trace of small				
		9 ss	10	%			gravel, tough	3000	O	▲ 21.4	
		10 ss	8	%			Gray silty clay, trace	2000	O		
		11 ss	8	%			small gravel, occasional silt	2000	O	19.9	
		12 ss	16	%			seams, tough	3500	O		
		13 ss	14	%			Gray clay, trace of small to				
		14 ss	16	%			medium gravel, tough to very				
		15 ss	15	%			tough				
560.5	38.5						TILL				
558.0	41.0	16 ss	16	%			Gray clay, trace of small gravel, occasional silt	35000	O	4500	
		17 ss	18	%			seams, VT				
		18 ss	17	%			Gray silty clay, little sand,				
		19 ss	19	%			trace of small gravel, very				
		20 ss	25	%			tough				
		21 ss		%							
544.0	55.0	22 ss	30	%			End of boring				
							Note: Concrete rubble, clay, brick and gravel fill				

1. END FEET IN GROUND SURFACE  
 2. SAMPLE LENGTH  
 3. TYPE OF SAMPLE  
 4. PENETRATION BLOWS PER FOOT  
 5. SAMPLE LENGTH  
 6. WEIGHT OF SAMPLE RECOVERED  
 7. DENSITY IN GRAMS PER CM. FOOT

## DESCRIPTION

Wc ▲ NATURAL

NO - WASMOUT

**BCR—BEFORE CASING REMOVAL**

ALGER  
- 195 - 107

ACR - AFTER CASING H  
WD - WHILE DRILLING

SPLIT SPOT  
SHEATHY

WCI = WET CAVE IN  
DCI = DRY CAVE IN

ST FISH TAIL  
S/125

UNCONFINED CO

U - CORE  
WATER C

**POUNDS PER SQ.  
F.T.**

---

— 1 —

*[A long horizontal black redaction bar.]*

FOR Waste Management, Inc.  
PROJECT: Proposed Solid Waste Disposal Site  
LOCATION Lansing, Illinois

METHOD OF BORING: HS  
SPLIT SPOON SIZE: 2 IN. 9.0', W.D. 18.5' dry  
WT. OF HAMMER 140 lbs Dry S.C.R.  
INCH DROP 30 damp A.C.R. 53.5'  
SHELLY TUBE SIZE 7.3" 24 HRS AFTER DRILLING 4.7' 814 DAYS  
CASING USED 2 1/2" I.D. -HS 2.8' 8 5' NODON REPAIRING

### SOIL BORING LOG NO. 4

WALTER H. FLOOD & CO., INC.

• Engineers •

• CHICAGO • KALAMAZOO •

DATE OF BORING:	1-10-72	BY:	BJ&JAF:jmc
JOB NO.:	7205-0005	VERTICAL SCALE:	1"=10'

ELEV	DEPTH	S	T	N	LR	DD	DESCRIPTION	LABORATORY		OPENETROMETER			
								Q	100G	3	4	6	8
566.5	0.0						Ground surface						
593.5	3.0	1 ss	9	17			Concrete rubble, clay, sand, brick and gravel fill						
591.5	5.0	2 ss	17				Brown clay fill, some black clay	2500	O	21.7			
587.5	9.0	3 ss	9				Brown clay, tough	2000	O				
	4 ss	22					Gray silt, medium dense to dense			0.2			
583.0	13.5	5 ss	31				Gray clay, tough	2500	O	19.6			
	6 ss	15					L/Mc	2500	O				
578.0	18.5	7 ss	11				Gray clay, trace of small gravel, occasional silt seams	2000	O	23.9			
	8 ss	6					tough	2000	O				
573.0	23.5	9 ss	8				Gray clay, trace of small gravel, tough to very tough	2000	O				
	10 ss	13					T/LC	3500	O	20.5			
	11 ss	14						3500	O				
	12 ss	12						3500	O				
	13 ss	16						3500	O	19.0			
	14 ss	20						3000	O	4			
	15 ss	21							O	4000			
557.2	39.3	16 ss	48				Gray silt, dense to very dense			0	5000		
554.0	42.5	17 ss	51							19.0			
	18 ss	22								4			
	19 ss	25								15.5			
	20 ss	25								O	4500		
	21 ss	32								O	5000		
543.0	53.5						Gray silt, dense			O	5500		
541.5	55.0	22 ss	44				End of boring						

TEST	DESCRIPTION		TEST											
								W.C.	NATURAL	10	20	30	40	50
TEST	WASHOUT		TEST											
TEST	AUER		ACR											
TEST	HOLLOW STEM AUER		ACR											
TEST	SPLIT SPOON		WD											
TEST	SHELL TUBE		WCA											
TEST	STICK		WCA											
TEST	STRENGTH		DCI											
TEST	WATER CONTENT PERCENT		UNCONFINED COMPRESSIVE STRENGTH											
TEST			POUNDS PER SQUARE FOOT											

FOR: Waste Management, Inc.  
 PROJECT: Proposed Solid Waste Disposal Site  
 LOCATION Lansing, Illinois

METHOD OF BORING:	HS	WATER LEVEL READINGS
SPLIT SPOON SIZE:	2 IN.	2.0', W.D. 8.5', 13.
WT. OF HAMMER	140 LBS.	None B.C.R.
INCH DROP	30	64.0' A.C.R.
SHELBY TUBE SIZE		4.5' @ 48 HRS. AFTER D.
CASING USED	2 1/2" IDHS	HRS. AFTER D.

SOIL BORING LOG NO. 5  
Sheet 1 of 2  
WALTER H. FLOOD & CO., INC.

• Engineers •

• CHICAGO • KALAMAZOO •

DATE OF  
BORING: 5-23-72

BY: BJ&JA6MC : bc

File No.: 7205-0005-1

VERTICAL  
SCALE: 1" = 10'

ELEV.	DEPTH	S	T	N	LN	DD	DESCRIPTION	QUA LABORATORY X 1000	O PENETROMETER			
								2	4	6	8	10
587.0	0.0						Ground surface					
595.0	2.0	1	ss	14	21		Sand, gravel & clay fill		29.3			
593.5	3.5	2	ss	40	21		Dark gray to brown clay fill			▲		
591.0	6.0	3	ss	6	21		Brown and gray clay fill, some concrete rubble & wood frag-	1500		▲ 22.0		
588.5	8.5	4	ss	15	21		Brown clay, stiff	○	27.9			
586.0	11.0	5	ss	7	21		Brown silt, medium dense			▲ 24.1		
583.5	13.5	6	ss	13	21		Gray clay, stiff	1500		▲ 22.0		
581.0	16.0	7	ss	3	21		Gray silt, medium dense	1000		▲ 18.8		
		8	ss	6	21		Gray clay, soft to stiff	○	20.5			
								L 40	2000	▲ 24.1		
576.0	21.0	9	ss	9	21		Gray clay, trace of small gravel, occasional silt stems, tough	2500	○	▲ 19.6		
573.5	23.5	10	ss	12	21		Gray clay, trace of small gravel, tough to very tough	3500		19.3		
		11	ss	13	21			3000	○	19.0		
		12	ss	14	21			14.9	▲ ○	3500		
		13	ss	13	21			7/16		3500	▲ 19.6	
		14	ss	15	21					3500	▲ 19.9	
		15	ss	16	21					4000	○ 19.6	
		16	ss	16	21					19.9	○ 4500	
556.0	41.0	17	ss	32	21		Gray silty clay with small to medium gravel, hard		▲ 11.6			9000+
553.5	43.5	18	ss	44	21		Gray silty clay, trace of small gravel, occasional silt stems, hard		▲ 12.1			9000+
551.0	46.0	19	ss	32	21		Gray silty clay, trace of small gravel, hard		▲ 12.1			9000+
		20	ss	25	21				▲ 11.6			9000+
		21	ss	17	21				▲ 12.1			9000+
		22	ss	24	21				▲ 11.8			9000+
		23	ss	26	21				▲ 10.8			9000+
		24	ss	52	21				▲ 10.6			9000+ C

Continued on Sheet 2

ELEV DEPTH S N LA RD

**DESCRIPTION**

ed. annue f. 100

**LEGEND**      DEPTH FEET BELOW GROUND SURFACE  
 1      SAMPLE NUMBER  
 2      TYPE OF SAMPLE  
 3      PENETRATION DEPTH PER FOOT  
 4      SAMPLE LENGTH  
 5      LENGTH OF SAMPLE RECOVERED  
 6      DRY DENSITY IN POUNDS/CF

NO	WA SHOUT
A	A UGER
NS	MULLIW
S	SPLIT SP
ST	SHELBY T
E	FISHTAIL
C	CURE
W	WATER C

BCR - BEFORE CASING REMOVAL  
 ACR - AFTER CASING REMOVAL  
 WD - WHILE DRILLING  
 WCI - WET CAVE IN  
 DCI - DRY CAVE IN  
 UU - UNCONFINED COMPRESSIVE  
       POUNDS PER SQUARE FOOT

FOR . Waste Management, Inc.  
 PROJECT. Proposed Solid Waste Disposal Site  
 LOCATION Lansing, Illinois  
 METHOD OF BORING: SPLIT SPOON SIZE: IN. WATER LEVEL READINGS  
 WT. OF HAMMER LBS. W.D. S.C.R. A.C.R.  
 INCH DROP See Sheet 1 MRS. AFTER DRILLING  
 SHELBY TUBE SIZE  
 CASING USED HRS. AFTER DRILLING

**SOIL BORING LOG NO. 5**  
Sheet 2 of 2

**WALTER H. FLOOD & CO., INC.**

• Engineers •

• CHICAGO • KALAMAZOO •

**DATE OF** See Sheet 1

三

177-118

VER

**LEGEND**      **TESTS**      **TESTS**      **TESTS**      **TESTS**

1	SAMPLE NUMBER
2	TEST NUMBER
3	TEST NUMBER AS READING
4	AMOUNT TESTED
5	TEST CAMP CODE
6	TEST CAMP NUMBER

**DESCRIPTION**

10 20 30 40 50  
4. **NATURAL**

#### **HCB - BEFORE CASING REMOVAL**

ACR - BEFORE CASING RING

WD WHILE DRILLING  
WCI - WET CAVE IN

WET - WET CAVE IN  
GCI - GRY CAVE IN

## Qu - UNCONFIRMED CONFIDENTIAL

**QU - UNCONFINED COMPRESSIVE STRENGTH  
POUNDS PER SQUARE FOOT**



FOR Waste Ma  
PROJECT: Proposed  
LOCATION Lansing,

## Waste Management, Inc.

**PROJECT:** Proposed Solid Waste Disposal Site

**LOCATION** Lansing, Illinois

METHOD OF BORING:  
SPLIT SPOON SIZE:  
WT. OF HAMMER  
INCH DROP  
SHELBY TUBE SIZE  
CASING LINED

11  
L

### **WATER LEVEL READINGS**

W.D.

U.C.A.

A.C.R.

**MRS. AFTER DRILLING**

**HRS. AFTER DRILLING**

**SOIL BORING LOG NO. 6**  
**Sheet 2 of 2**

**WALTER H. FLOOD & CO., INC.**

## **Epithelial** •

• CHICAGO • KALAMAZOO •

**DATE OF  
BOILING:**

See Sheet 1

100 NO.

**VERTICAL  
SCALE:**

100 DEPTH S T P H M T R

**DESCRIPTION**

10 20 30 40 50

NO	WASHOUSE
A	BAUER
S	VALLOW
SS	SPLIT SPR.
TT	HILL BY T.
T	FIGHT TAPE
C	COKE
NO.	WATER C.

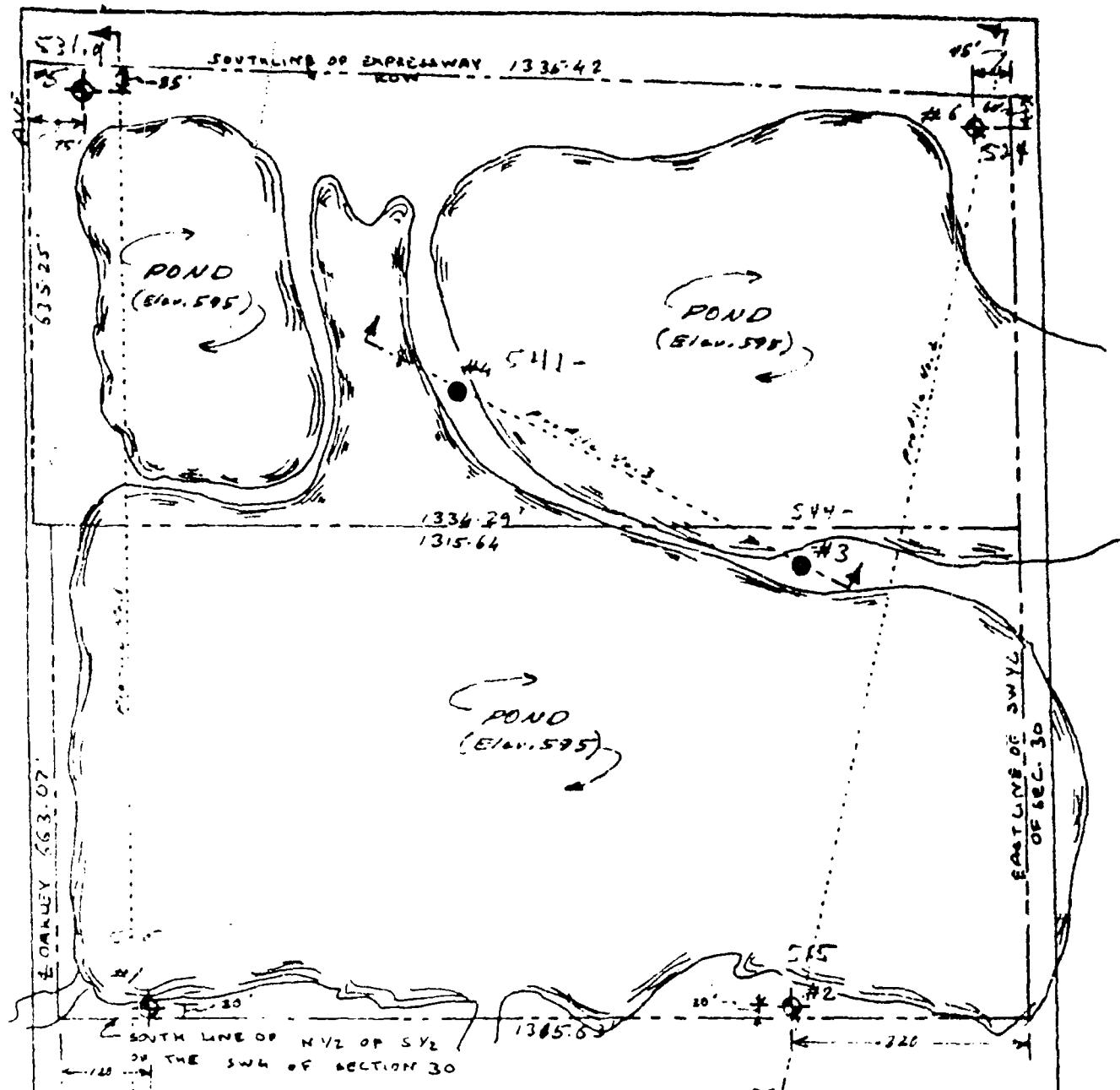
**BCH BEFORE CASING REMOVAL  
ACH AFTER CASING REMOVAL**

W O - WHILE DRILLING  
NO : NOT GAVE IN

NET - WET CAVE IN  
DCI - DRY / CAVE IN

**Qu UNCONFINED C REACTIONS 25%**

**ICENT**      **POUNDS PER SQUARE FOOT**



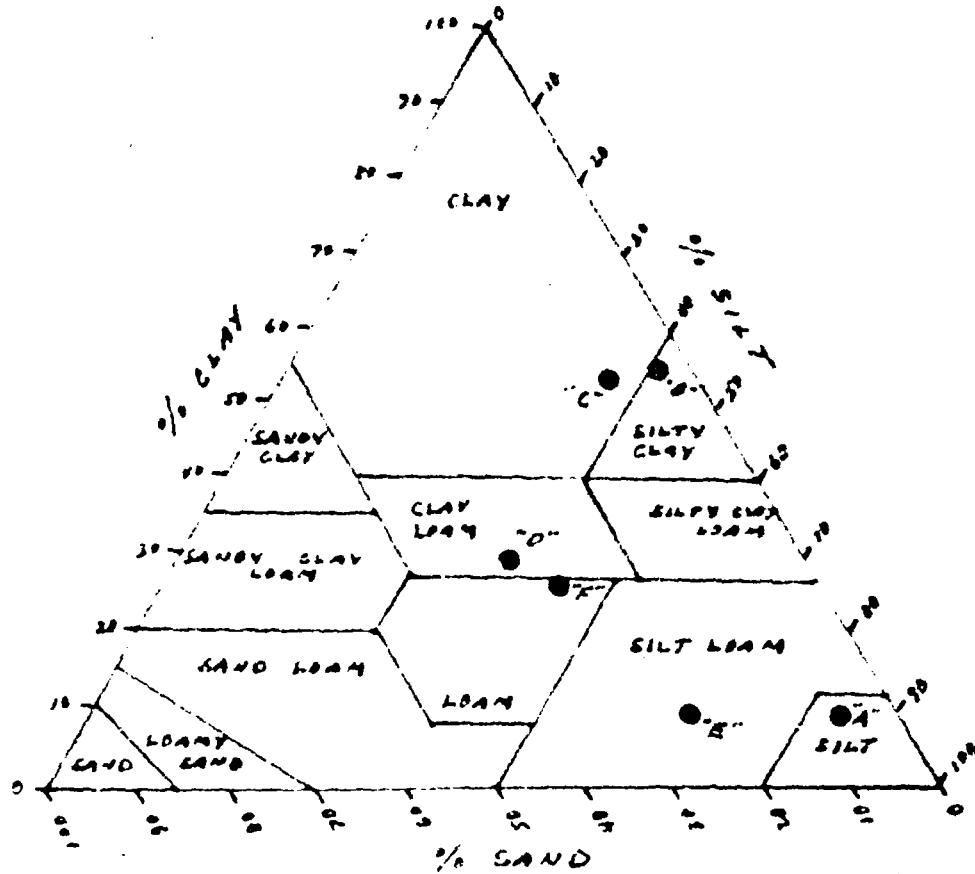
LESENGE

- Boring Locations (January 1972)

16. *Leucosia* *leucostoma* *Leucostoma*



<p style="text-align: center;"><b>SOIL BORING LOCATIONS</b>  <b>PROPOSED SOLID WASTE</b>  <b>DISPOSAL SITE</b>  <b>LANSING, ILLINOIS</b></p>	
<p style="text-align: center;"><b>WALTER H. FLOOD &amp; CO. INC.</b></p>	
SCALE 1:200	BY <u>KCM</u>
JOB/LAB NO <u>7205005</u>	DATE <u>1-7-12</u>



NOTES:

• Test Results

- 'A' = Locust Grove Clay
- 'B' = Locust Grove Clay
- 'C' = Glacial Till (Rock Ridge)
- 'D' = Glacial Till (Troy)
- 'E' = Glacial Till (Valparaiso)
- 'F' = Glacial Till (Prairie Valley)

where from which  
loamy

SOIL TEXTURAL CLASSIFICATION	
U.S. DEPARTMENT OF AGRICULTURE	
SOLID WASTE DISPOSAL SITE	
NEW TERRACES & STONE BANK, LANSING, INDIANA	
WALTER H. FLOOD & CO. INC.	
SCALE	PT. 480
JOB/LAB NO. 110, MAP 1	DATE 6/29/72

*NOTE:* Gold and silver are known only  
at 1000 ft. elev. in the upper portion of  
the valley, but at 1500 ft. elev. it has been  
observed to occur in the lower part of the  
valley. The only sample taken was at 1000 ft.  
elev. and contained 1.5% gold.

## SOIL PROFILE 7

PROPOSED 50000 GALLON SURFACE SINK

MS. A. 2.6. 226 (cont'd.) June 1923

1. *Entomophaga* **1966**, **11**, 1-16  
WITH FIGURE OF *Leptothrix* (Lepidoptera)

*Language and Social Structure*

1865-1866 1867 1868 1869

## near section 4-3

	2	3	4	5	6	
600					600	
590	10 loamy 11 sand 12 loam 13 clay 14 silt 15 loam 16 clay 17 sand 18 loam 19 sand 20 loam 21 loam 22 loam 23 sand 24 loam 25 loam 26 loam 27 loam 28 loam 29 loam 30 loam 31 loam 32 loam 33 loam 34 loam 35 loam 36 loam 37 loam 38 loam 39 loam 40 loam 41 loam 42 loam 43 loam 44 loam 45 loam 46 loam 47 loam 48 loam 49 loam 50 loam 51 loam 52 loam 53 loam 54 loam 55 loam 560		(CLAY ACCUMULATED SOILS WITH SAND)			
570	10 loam 9 sand 10 loam 11 loam 12 loam 13 loam 14 loam 15 loam 16 loam 17 loam 18 loam 19 loam 20 loam 21 loam 22 loam 23 loam 24 loam 25 loam 26 loam 27 loam 28 loam 29 loam 30 loam 31 loam 32 loam 33 loam 34 loam 35 loam 36 loam 37 loam 38 loam 39 loam 40 loam 41 loam 42 loam 43 loam 44 loam 45 loam 46 loam 47 loam 48 loam 49 loam 50 loam 51 loam 52 loam 53 loam 54 loam 550	CLAY TILL (GLACIAL)				
560	18 loam 19 loam 20 loam 21 loam 22 loam 23 loam 24 loam 25 loam 26 loam 27 loam 28 loam 29 loam 30 loam 31 loam 32 loam 33 loam 34 loam 35 loam 36 loam 37 loam 38 loam 39 loam 40 loam 41 loam 42 loam 43 loam 44 loam 45 loam 46 loam 47 loam 48 loam 49 loam 50 loam 51 loam 52 loam 53 loam 54 loam 550	CLAY TILL (EOLIAN)				
570	10 loam 11 loam 12 loam 13 loam 14 loam 15 loam 16 loam 17 loam 18 loam 19 loam 20 loam 21 loam 22 loam 23 loam 24 loam 25 loam 26 loam 27 loam 28 loam 29 loam 30 loam 31 loam 32 loam 33 loam 34 loam 35 loam 36 loam 37 loam 38 loam 39 loam 40 loam 41 loam 42 loam 43 loam 44 loam 45 loam 46 loam 47 loam 48 loam 49 loam 50 loam 51 loam 52 loam 53 loam 54 loam 550	CLAY TILL (GLACIAL)				
580	10 loam 11 loam 12 loam 13 loam 14 loam 15 loam 16 loam 17 loam 18 loam 19 loam 20 loam 21 loam 22 loam 23 loam 24 loam 25 loam 26 loam 27 loam 28 loam 29 loam 30 loam 31 loam 32 loam 33 loam 34 loam 35 loam 36 loam 37 loam 38 loam 39 loam 40 loam 41 loam 42 loam 43 loam 44 loam 45 loam 46 loam 47 loam 48 loam 49 loam 50 loam 51 loam 52 loam 53 loam 54 loam 550	CLAY TILL (GLACIAL)				
590	10 loam 11 loam 12 loam 13 loam 14 loam 15 loam 16 loam 17 loam 18 loam 19 loam 20 loam 21 loam 22 loam 23 loam 24 loam 25 loam 26 loam 27 loam 28 loam 29 loam 30 loam 31 loam 32 loam 33 loam 34 loam 35 loam 36 loam 37 loam 38 loam 39 loam 40 loam 41 loam 42 loam 43 loam 44 loam 45 loam 46 loam 47 loam 48 loam 49 loam 50 loam 51 loam 52 loam 53 loam 54 loam 550	CLAY TILL (GLACIAL)				
600	10 loam 11 loam 12 loam 13 loam 14 loam 15 loam 16 loam 17 loam 18 loam 19 loam 20 loam 21 loam 22 loam 23 loam 24 loam 25 loam 26 loam 27 loam 28 loam 29 loam 30 loam 31 loam 32 loam 33 loam 34 loam 35 loam 36 loam 37 loam 38 loam 39 loam 40 loam 41 loam 42 loam 43 loam 44 loam 45 loam 46 loam 47 loam 48 loam 49 loam 50 loam 51 loam 52 loam 53 loam 54 loam 550	CLAY TILL (GLACIAL)				

## SOIL PROFILE 2

PROPOSED SOIL TEST NUMBER 3778  
LANDING NO. 44401972  
100 ft. 700 ft. 500 ft.  
100 ft. 700 ft. 500 ft.  
100 ft. 700 ft. 500 ft.  
100 ft. 700 ft. 500 ft.

NOTE: Soil samples for testing and all other tests are to be taken at random locations in each horizon and may be fully representative of general soil characteristics.

*intercalate questionable*  
see section 2-6

## SOIL PROFILE 3

PROPOSED 20000 VOTE: 20000 VOTE  
LAWYER - LAWYER

427E

about six hundred sea  
lions of all the age groups.  
The total was estimated at  
several thousand individuals  
because no more than one in  
every twenty or thirty  
had been seen before.

## SIEVE ANALYSIS

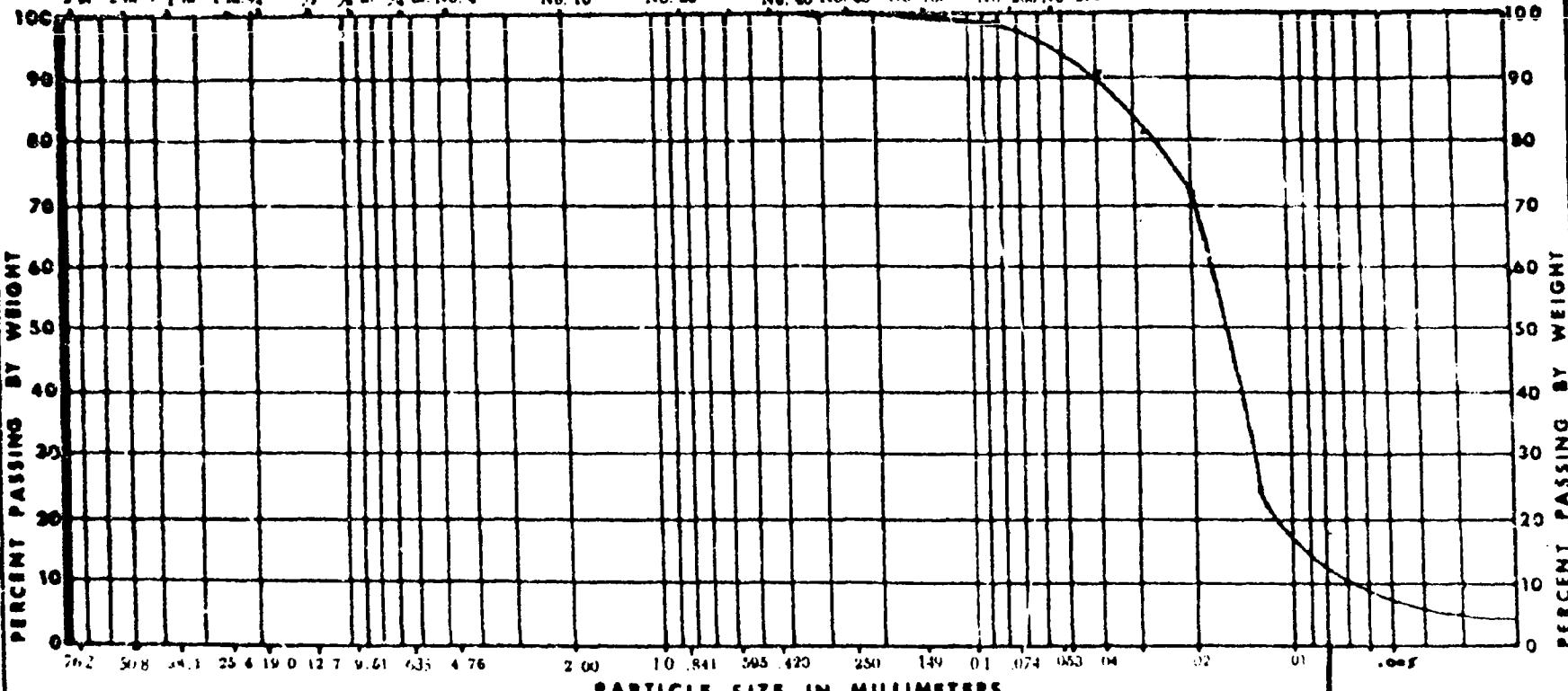
## HYDROMETER ANALYSIS

CLEAR SQUARE OPENINGS

3 in 2 in 1½ in 1 in ½ in ½ in No. 4

U.S. STANDARD SERIES

No. 10 No. 20 No. 40 No. 60 No. 100 No. 200 No. 270



LARGE GRAVEL	MEDIUM GRAVEL	SMALL SAND
--------------	---------------	------------

COARSE	NEVER	FINE
SAND		

SILT	CL	CLAY
------	----	------

BORE NO.	SAMPLE NO. "A"
DESCRIPTION	SILT
CLASSIFICATION	Lenticular Silt

DRY DENSITY	112.9 pcf
WATER CONTENT	17.9%
DETER. OF SAT.	97.5%
VOID RATIO	0.500
SPEC. GRAVITY	2.71

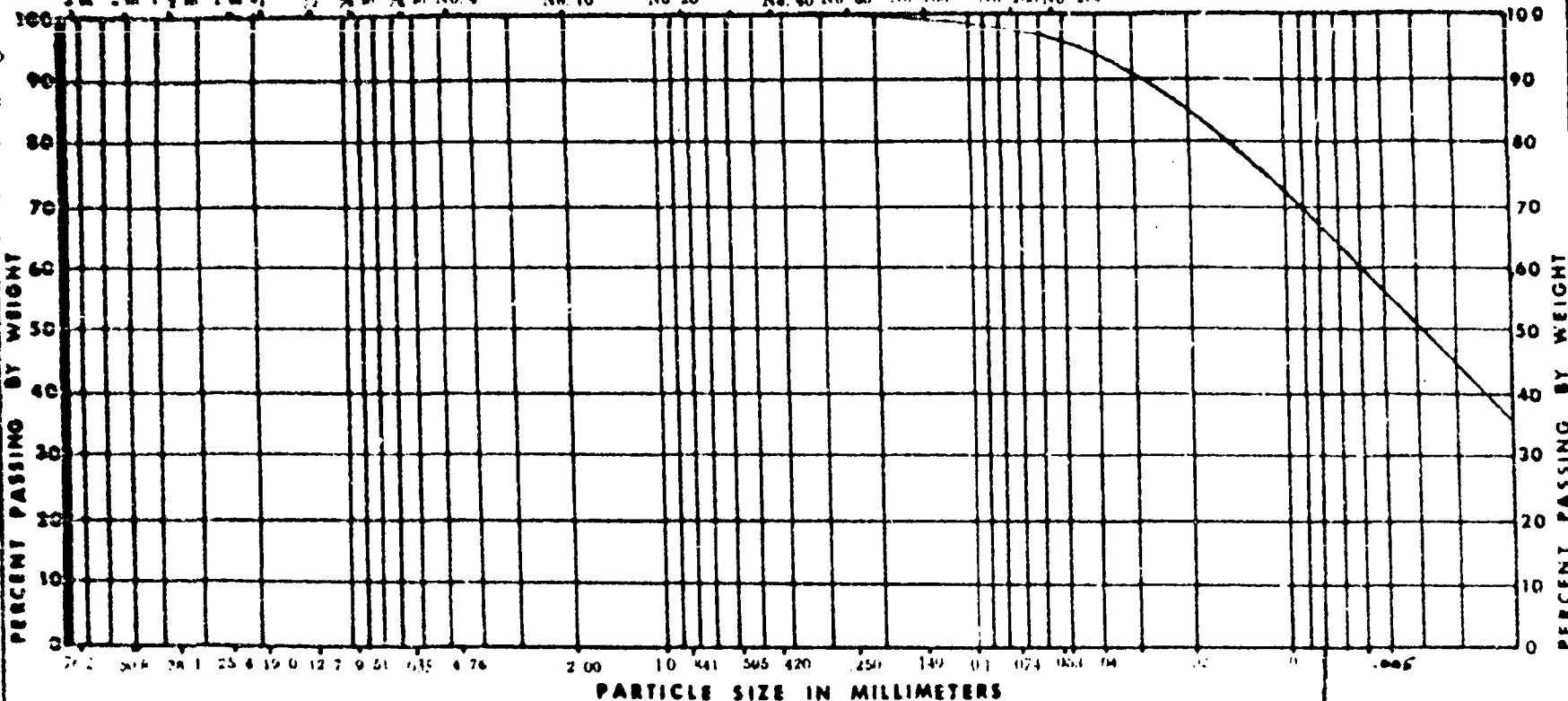
SOIL GRADATION ANALYSIS	
SOLID WASTE DISPOSAL SITE	VICINITY OF
TORRENCE AVE. & TRI-STATE BLDG.	LANSING, ILLINOIS
JOB NO. 7106005-1	DATE 6/29/74
WALTER H FLOOD AND COMPANY INC	CHICAGO ILLINOIS 60611

## SIEVE ANALYSIS

## HYDROMETER ANALYSIS

CLEAR SQUARE OPENINGS

3 in 2 in 1½ in 1 in ½ in 1/4 in 3/8 in No. 4 No. 10 No. 20 No. 40 No. 60 No. 100 No. 200 No. 270



LARGE	MEDIUM	SMALL
GRAVEL		

VERY	COARSE	MEDIUM	FINE	VERY
SAND				

SILTY	CLAY
-------	------

 $\% \text{ DRY BY VOL} = .339$ 

BORE NO.	SAMPLE NO. "B"
DESCRIPTION	SILTY CLAY
CLASSIFICATION	Lacustrine Clay

DRY DENSITY	108.8 p.-t
WATER MOISTURE CONTENT	19.9 %
PERCENT OF SAT.	120.0 %
VOID RATIO	0.509
SPEC. GRAVITY	2.63

SOIL GRADATION ANALYSIS	
SOLID WASTE DISPOSAL SITE	Virginia St.
TORRENCE AVE. & TRI-STATE EXPY.	LANSING, ILLINOIS
JOB NO. 7205005	DATE 1/12/72
WALTER H. FLOOD AND COMPANY INC	CHICAGO ILLINOIS 60637

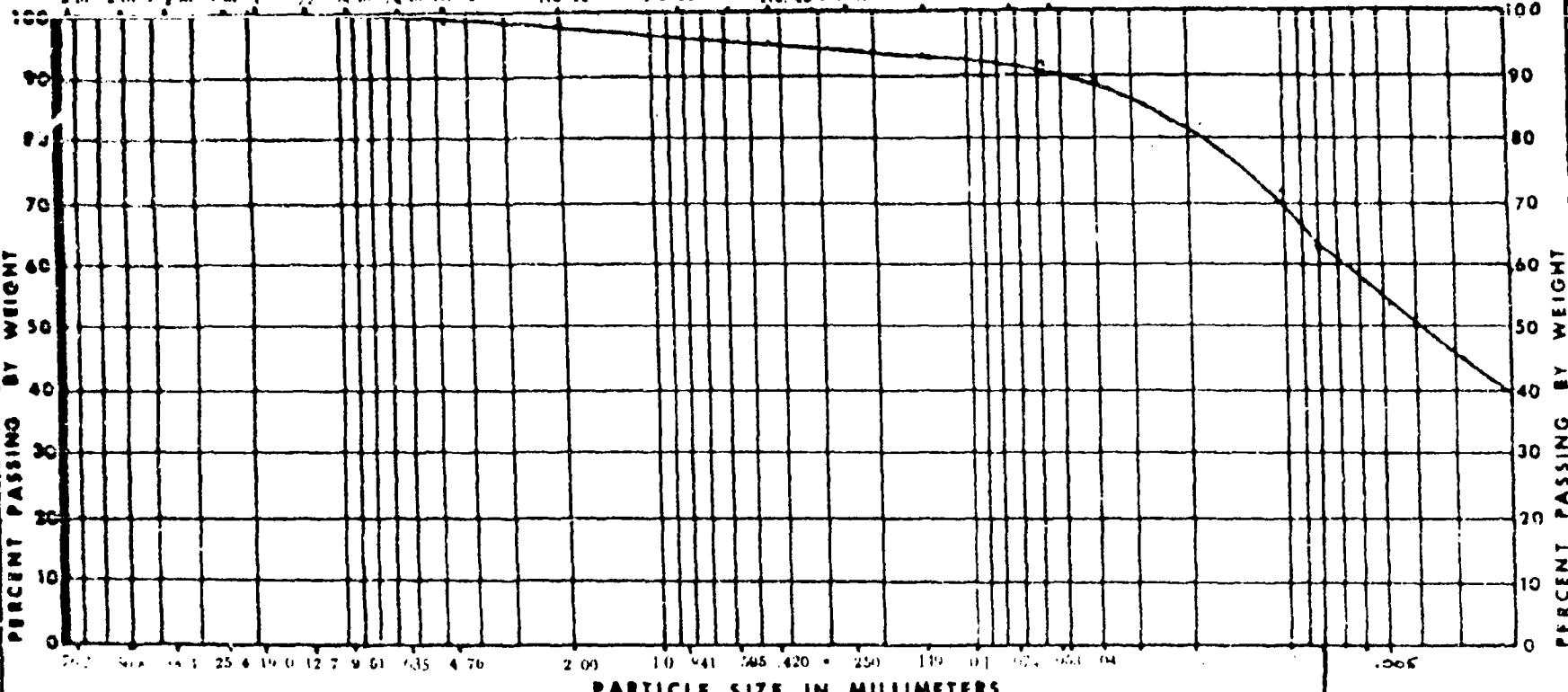
## SIEVE ANALYSIS

## HYDROMETER ANALYSIS

CLEAR SQUARE OPENINGS

U.S. STANDARD SERIES

3 in 2 in 1½ in 1 in ½ in ¼ in No 4 No 10 No 20 No 40 No 60 No 100 No 200 No 270



BORE NO. SAMPLE NO. "C"

DESCRIPTION CLAY

CLASSIFICATION Glacial T-11  
(Park Ridge)

DRY DENSITY	113.0 $\text{lb/ft}^3$
MOISTURE CONTENT	17.9%
DEGREE OF SAT.	100.0%
VOID RATIO	0.40
SPEC. GRAVITY	2.54

## SOIL GRADATION ANALYSIS

SOLID WASTE DISPOSAL SITE  
VICINITY OF  
TORRENCE AVE. & TRI-STATE HWY.  
LANSING, ILLINOISJOB NO. 7203005-1 DATE 5/29/72  
WALTER H. FLOOD AND COMPANY, INC.  
CHICAGO, ILLINOIS 60637

## SIEVE ANALYSIS

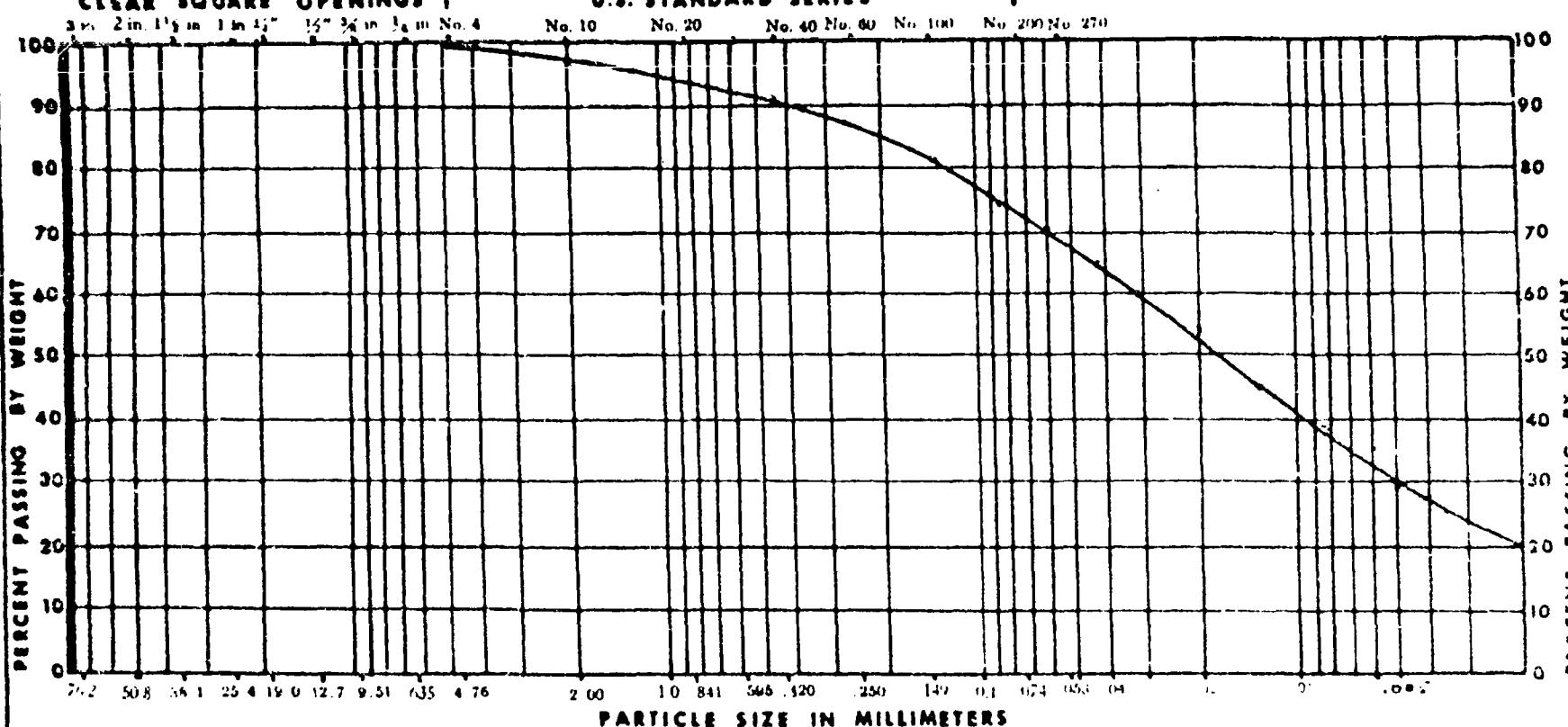
## HYDROMETER ANALYSIS

CLEAR SQUARE OPENINGS

3 in. 2 in. 1 1/2 in. 1 in. 1/2 in. 1/4 in. 3/8 in. 1/2 in. No. 4

U.S. STANDARD SERIES

No. 10 No. 20 No. 40 No. 60 No. 100 No. 200 No. 270



LARGE GRAVEL

MEDIUM GRAVEL

SMALL

COARSE

FINE

MEDIUM

SAND

FINE

MEDIUM

SILT

CLAY

BORE NO. SAMPLE NO. "D"

DESCRIPTION CLAY L3AM

CLASSIFICATION GLG/101 T:11

(T:1n/10g)

DRY DENSITY 116.3 pcf

MOISTURE CONTENT 15.2%

DEGREE OF SAT. 92.5%

V/S10 RATIO 0.483

SPEC. GRAVITY 2.69

SOIL GRADATION ANALYSIS

WASTE DISPOSAL SITE

LANSING, ILLINOIS

JOB NO. 7250005-1 DATE 8-2-71

WALTER H FLOOD AND COMPANY INC  
CHICAGO ILLINOIS 60637

## SIEVE ANALYSIS

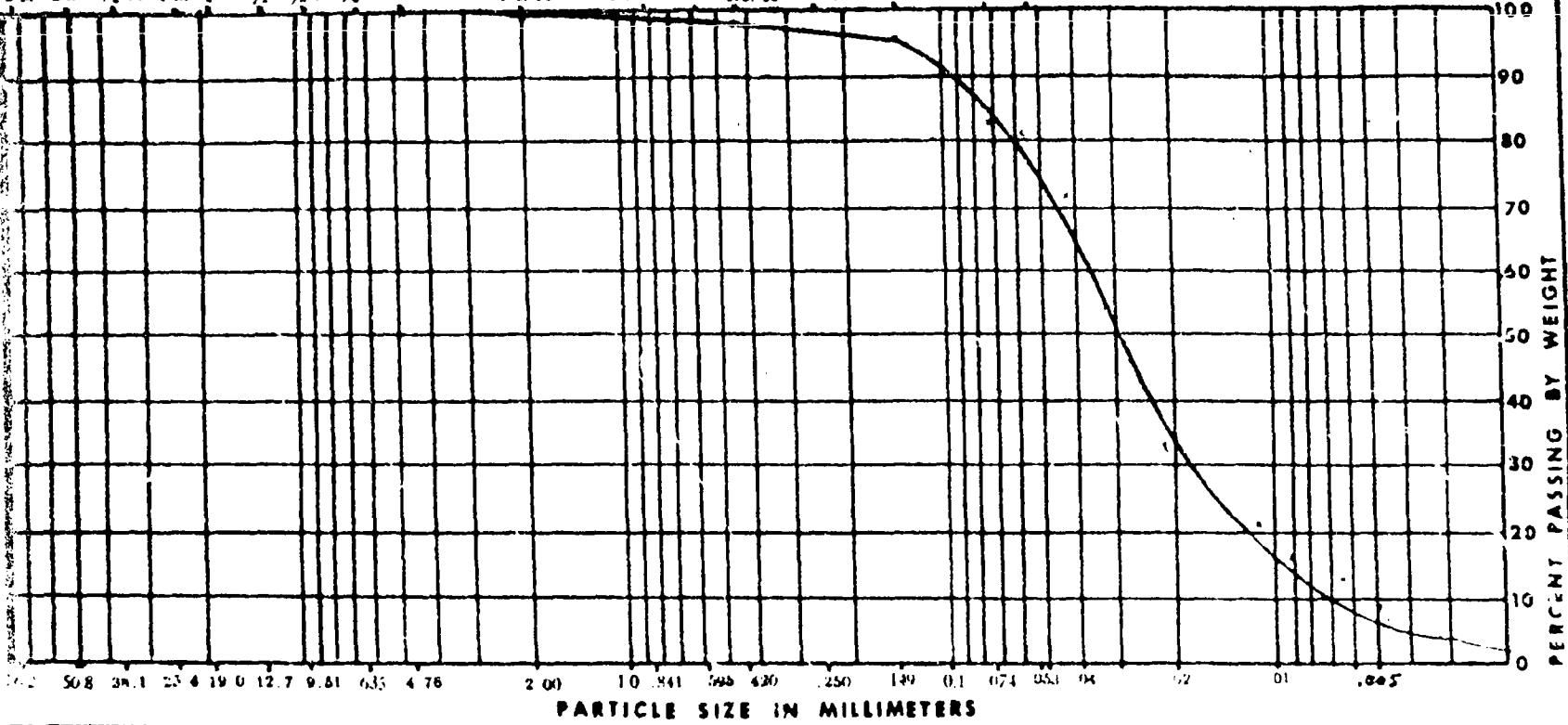
## HYDROMETER ANALYSIS

CLEAR SQUARE OPENINGS

2 in 2 in 1 $\frac{1}{2}$  in 1 in 1 $\frac{1}{2}$ " 1 $\frac{1}{2}$ " 3 in 1 $\frac{1}{2}$  in No. 4

U.S. STANDARD SERIES

No. 10 No. 20 No. 40 No. 60 No. 100 No. 200 No. 270



LARGE GRAVEL	MEDIUM GRAVEL	SMALL SAND
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PEBBLES	COARSE	FINE
	SAND	

SILT

CLAY

SITE NO.	SAMPLE NO. "E"
DESCRIPTION	SILT LOAM
CLASSIFICATION	G I G I T : 1 / (V e l o c i t y)

DRY DENSITY	125.8 pcf
MOISTURE CONTENT	12.1%
DEGREE OF SAT.	99.5%
VOID RATIO	0.324
SPEC. GRAVITY	2.67

SOIL GRADATION ANALYSIS	
WASTE DISPOSAL SITE	
LANSING, ILLINOIS	
JOB NO.	62545-1
DATE	6/25/72
WALTER H. FLOOD AND COMPANY INC	
CHICAGO ILLINOIS	60637

## SIEVE ANALYSIS

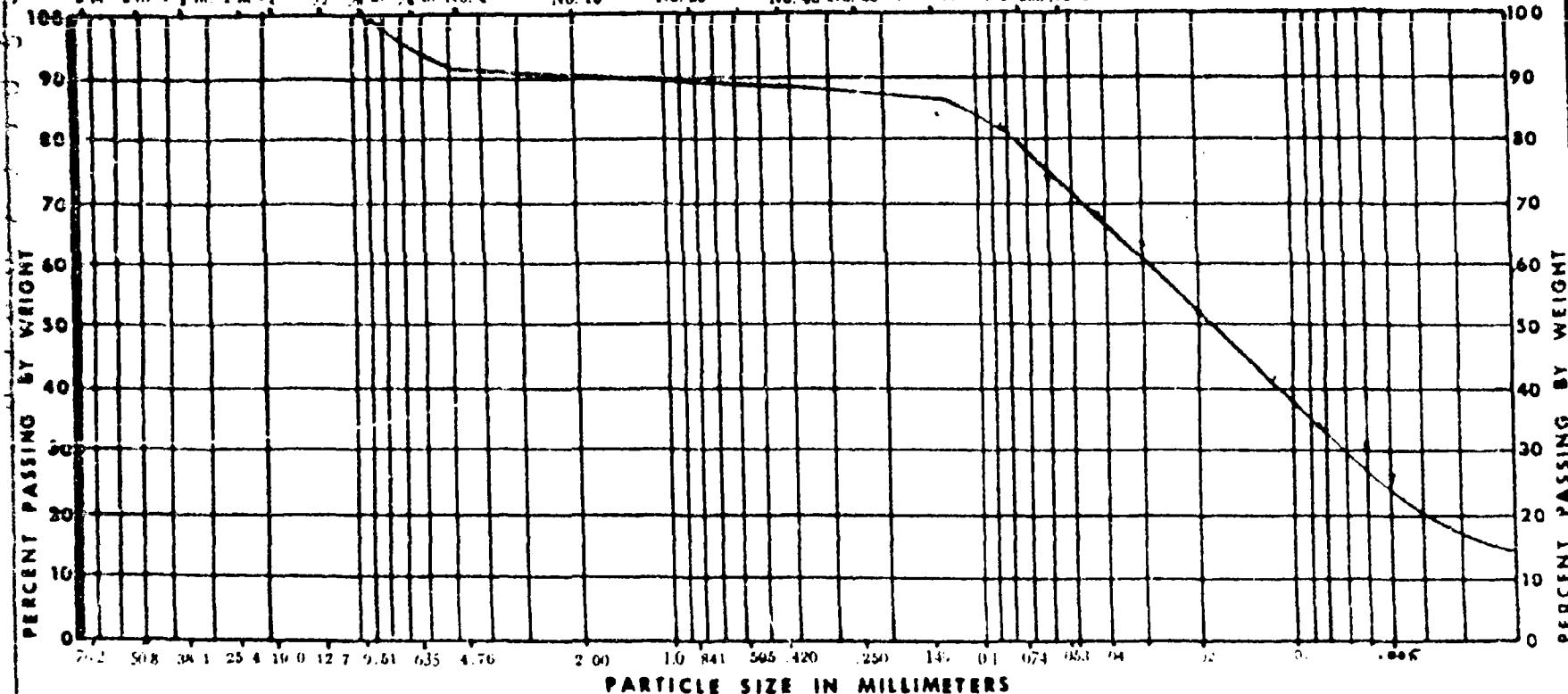
## HYDROMETER ANALYSIS

CLEAR SQUARE OPENINGS

3 in 2 in 1½ in 1 in ¾ in ½ in ¼ in ⅛ in No. 4

U.S. STANDARD SERIES

No. 10 No. 20 No. 40 No. 60 No. 100 No. 200 No. 270



PARTICLE SIZE IN MILLIMETERS

LARGE GRAVEL	MEDIUM GRAVEL	SMALL SAND	COARSE MOULD	FINE SAND	VERY FINE	SILT	CLAY
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BORE NO.	SAMPLE NO. "F"
DESCRIPTION	LOAM
CLASSIFICATION	G/pebb/ T:11 (Pre-Vol, granular)

DRY DENSITY	133.8 pcf
MOISTURE CONTENT	9.9 %
DENSITY OF SAT.	100.1 %
VOID RATIO	0.181
SPEC. GRAVITY	2.58

SOIL GRADATION ANALYSIS	
WASTE DISPOSAL SITE	
LANSING, ILLINOIS	
JOB NO. 7205625-1	DATE 6/20/82
WALTER H. FLOOD AND COMPANY, INC	
CHICAGO, ILLINOIS 60637	